REMARKS

By this amendment, applicants have amended the specification and claims to delete the subject matter deemed by the Examiner to constitute "new matter." Claims 1 and 17 have also been amended to recite that the substrate is free of a compressive strengthening layer. This amendment is supported by a disclosure at page 29, line 27 to page 30, line 3 of Applicants' specification. Applicants have also added claims 18-27 reciting that the substrate has a surface roughness of 5Å or less or less. See, e.g., page 31, Table 7 and page 32, lines 21-25 of Applicants' specification.

In view of the foregoing amendments to the specification and claims, reconsideration and withdrawal of the objection to the Preliminary Amendment under 35 U.S.C. 132 in numbered section 2 of the Office Action and the rejection of claims 1-17 under 35 U.S.C. 112, first paragraph, in numbered section 3 of the Office Action are requested.

Claims 1-17 stand rejected under 35 U.S.C. 102(b) and 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over the references cited in the notice of Decision to Revoke JP 3-211683 as applied in the parent application. Applicants traverse this rejection and request reconsideration thereof.

Initially, it is noted that the rejections in parent application serial 09/641,764 were rejections only under 35 U.S.C. 103(a), not under 35 U.S.C. 102. Neither the allegations in support of the rejection under 35 U.S.C. 103(a) in the parent application nor anything in the outstanding Office Action provides a sufficient basis for a rejection under 35 U.S.C. 102. That is, no allegations have been made by the Examiner as to how the presently claimed invention is anticipated by any one of the

applied references. Accordingly, the rejection in the outstanding Office must be withdrawn for this reason alone.

Moreover, it is submitted the presently claimed invention is neither disclosed nor suggested by the references cited in the Notice of Decision to revoke for the reasons set forth hereinafter.

The present invention relates to a substrate of a disk for recording information. An object of the present invention is to provide a substrate having high mechanical strength and superior chemical stability, thermal stability, and flatness. According to the present invention, the substrate is made of glass containing SiO_2 in an amount of 40-80% by weight, Al_2O_3 in an amount up to 17% by weight, and at least one rare earth element selected from the group consisting of Sc, Y, Pr, Nd, Pm, Sm and Eu. The transmittance for visible white light of the substrate is at least 60% and the substrate is free of a compressive strengthening layer.

Applicants have found that a sufficient mechanical strength of the glass substrate can be obtained by including rare earth elements selected from the group consisting of Sc, Y, Pr, Nd, Pm, Sm and Eu in the glass substrate, and high flatness of the glass substrate for recording information, i.e., a surface roughness of 5 nm or less, can be obtained by specifying that the transmittance of the glass substrate containing the rare earth elements for visible white light be at least 60%.

The reason the transmittance of the glass substrate containing the rare earth elements for visible white light is specified as at least 60% is that glass having such a high transmittance has a characteristic of having a smooth flat surface. The correlation between smooth flatness and transmittance is explained based on the experimental data shown in Table 4 and Table 7 of applicants' specification.

In accordance with the description and experimental data contained in applicants' specification, it is understandable that a glass substrate superior in hardness and smooth flatness, e.g., a surface roughness of 5 nm or less, can be obtained by using a glass substrate containing rare earth elements selected from the group consisting of Sc, Y, Pr, Nd, Pm, Sm and Eu, having a high transmittance and free of a compressive strengthening layer.

In order to strengthen a disc substrate, a crystallizing treatment or chemical strengthening treatment was performed conventionally, and therefore, it was necessary to use glass containing much alumina for crystallization, or to form a compression stress layer (compressive strengthening layer). However, this results in an increase in cost, development of asperities on the crystalline surface, peeling of the compression stress layer resulting from the alkali compound, etc. The present invention makes it possible to solve those problems, and provides a substrate free of a compressive strengthening layer.

The Notice of Decision to revoke JP 3211683 cites the following documents:

(1) Kou No. 1 Evidence...JP-A-5-32431 (1993)

(2) Kou No. 2 Evidence...JP-A-8-180402 (1996)

(3) Kou No. 3 Evidence...JP-A-7-157331 (1995)

(4) Kou No. 4 Evidence...U.S. Patent No. 3,804,646

(5) Kou No. 5 Evidence... "Rare Earth- Their physical properties and application (Issued June 10, 1984, by GIHOUDO)

(6) Kou No. 6 Evidence..."Dictionary of Glass" (Issued September 20, 1985, by ASAKURA SHOTEN)

(7) Kou No. 7 Evidence... "Glass Engineering Handbook" (Issued November 30, Showa 42 (1977), by ASAKURA SHOTEN)

(8) Kou No. 8 Evidence... "Science of Amorphous Glass" (Issued June 30, Showa 58 (1983), by UCHIDAROUKAKUEN)

(9) Kou No. 9 Evidence... Japanese Industrial Standard, JISZ81O2 Abstract

(10) Kou No. 10 Evidence... Japanese Industrial Standard, JISB9905-1959 Abstract

(11) Kou No. 11 Evidence...JP-A-7-300340 (1995)

(12) Kou No. 12 Evidence...JP-A-7-240025(1995)

(13) Kou No. 13 Evidence...JP-A-5-303735 (1993)

(14) Kou No. 14 Evidence..."NEW GLASS" Vol. 10, No. 4, 1995 p.56-60

(15) Kou No. 15 Evidence...JP-A-3-162712 (1991)

(16) Kou No. 16 Evidence...JP-A-1-201043 (1989)

The document referred to as "Kou No. 1 Evidence" discloses a glass substrate for recording information made of chemically strengthened glass. A glass composition wherein La_2O_3 is contained in an amount of 0.5 wt.% is disclosed in embodiment 5. Although "Kou No. 1 Evidence" indicates that La_2O_3 can be contained in the glass substrate in a concentration in the range that does not deteriorate the characteristics of the glass substrate of the invention, this document is silent on the reason why La_2O_3 should be contained. Thus, this document does not disclose a substrate made of glass containing at least one rare earth element selected from the group consisting of Sc, Y, Pr, Nd, Pm, Sm and Eu.

"Ko No. 1 Evidence" relates to a chemically reinforced class having a deep compressive stress layer. Therefore, this document does not disclose and would not have suggested a substrate of a disk for recording information which is a free of a compressive strengthening layer, as presently claimed.

This document also does not disclose a substrate made of glass in which the transmittance for visible white light of the substrate is at least 60%, and does not suggest that a smooth, flat substrate can be obtained in this manner. Furthermore, this document does not suggest that adding a La element can increase hardness. Thus, this document clearly does not suggest the presently claimed invention.

The document referred to as "Kou No. 2 Evidence" discloses a chemically strengthened glass substrate for recording information, and discloses that "La_2O_3 may be mixed with an alumino-silicate glass less than 5 wt.%" in paragraph of [0022]. However, this document, like "Kou No. 1 Evidence," is silent on the reason why La_2O_3 should be contained. Therefore, this document does not suggest the addition of at least one rare earth element selected from the group consisting of Sc, Y, Pr, Nd, Pm, Sm and Eu to the glass in order to increase the mechanical strength of the glass. Furthermore, this document does not suggest that highly smooth and flat glass is obtainable by making the transmittance for visible white light of the glass at least 60 %.

Moreover, this document discloses a surface-tempered glass substrate, the object of which is to make the amount of the metal ions eluted from the surface extremely low. However, Applicants submit that, since a chemical strengthening treatment is performed in this reference, the elution of alkali can not be completely avoided, and the cost can not be reduced because of an increase in the number of treatment steps. In any event, this document does not disclose the presently claimed substrate, including one having a transmittance for visible white light of at least 60% and one which is free of a compressive strengthening layer.

The document referred to as "Kou No. 3 Evidence" discloses a colored crystallized glass for a magnetic disk. It is disclosed in claim 6 that "a colored

crystallized glass for magnetic disk ...[includes] La_2O_3 + Y_2O_3 + Gd_2O_3 +Ta_2O_5 + Nb_2O_5 + WO_3... 0~10%... by weight" and in paragraph [0009] that "at least one element selected from the group consisting of metallic oxides of Pr, Nd, and Er by 0.5~5% by weight is added into the crystallized glass as a coloring component." As metallic oxides, Pr_2O_3, Nd_2O_3, Er_2O_3, and the like are described. In paragraph [0031], it is disclosed that "La_2O_3, Y_2O_3, Gd_2O_3 components are effective for improving hardness and chemical resistance of the product, and then, at least one kind of or more than two kinds of these components can be contained by at most 10 % as a total amount". Furthermore, in the paragraph [0042], it is disclosed that "because the crystallized glass disclosed in the comparative example does not contain the coloring component, its color is white or transparent, and its Munsell value is 9 or not indicated. Therefore, it is understandable that identification of any defects is difficult."

According to the present invention, however, the substrate has a transmittance for visible white light of at least 60% and is free of a compressive strengthening layer. Such is neither disclosed nor suggested by this document; that is, "Kou No. 3 Evidence" does not describe the transmittance of the glass for visible white light and does not suggest that highly hard, smooth and flat glass is obtainable by making the transmittance for visible white light of the glass substrate containing the rare earth elements such as Sc, Y, Pr, Nd, Pm, Sm, Eu at least 60 %. Accordingly, the present invention is neither disclosed nor suggested by "Kou No. 3 Evidence."

The document referred to as "Kou No. 4 evidence," i.e., U.S. Patent No. 3,804,646 to Dumbaugh, Jr., discloses beryllium-free silicate glasses which high elastic moduli. The glasses comprises a MgO-Al_2O_3 -SiO_2 base competition field

containing about 8-40 mole percent total of high field strength modifiers, essentially including TiO_2 and La_2O_3, Ta_2O_5 or Y_2O_3, selected from the group consisting of TiO_2 and La_2O_3, Ta_2O_5, Y_2O_3, CaO and ZrO_2. It is disclosed that the glasses can be used for glass fiber reinforced structural material, laminated high-strength materials, structures for use at great depths under water, and razor blades. Thus, this document does not relate to a substrate of a disk for recording information. Therefore, the Dumbaugh, Jr. patent can not anticipate the presently claimed invention. Moreover, unless the glass of Dumbaugh, Jr. is applied as a substrate of a disk for recording information, one can only guess at the presently claimed properties, such as transmittance for visible white light. Moreover, the advantageous effects of the present invention, such as improved hardness and flatness are not suggested. Accordingly, the Dumbaugh, Jr. patent does not anticipate the presently claimed invention.

Applicants submit that the document referred to as "Kou No. 5 Evidence" also is silent about the application of a glass containing a rare earth element as a substrate of a disk for recording information. Accordingly, this reference also can not anticipate the presently claimed invention.

The Examiner alleged in the parent application that it would have been obvious to add rare earth elements to glasses to improve strength. However, the documents noted by the Examiner do not suggest that highly hard, smooth and flat glass is obtainable by making the transmittance for visible white light of the glass substrate containing the rare earth elements such as Sc, Y, Pr, Nd, Pm, Sm, Eu at least 60 %.

In the parent application, the Examiner alleges references 6-8 to "teach the desirability of controlling the crystalline structure within the glass as in claims 2-7."

This allegation is traversed. Moreover, these documents do not suggest that highly hard, smooth and flat glass is obtainable by making the transmittance for visible white light of a glass substrate containing rare earth elements such as Sc, Y, Pr, Nd, Pm, Sm, Eu at least 60 %. Accordingly, the present invention would not have been obvious in view of references 6-8.

The remaining references cited in the Notice of Decision to revoke JP 3211683 also do not suggest that highly hard, smooth and flat glass is obtainable by making the transmittance for visible white light of a glass substrate containing rare earth elements such as Sc, Y, Pr, Nd, Pm, Sm, Eu at least 60 %.

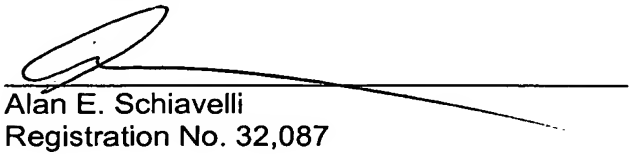
For the foregoing reasons, it is submitted that the presently claimed invention is patentable over the references cited in the Notice of Decision JP 3-211683.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 503.35524CC3), and please credit any excess fees to such deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP



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